Building Ω: Seeking Self-Reliance

A Wisconsin couple set out to build a resilient net-zero homestead largely on their own. The first step was creating a design that balanced performance, affordability, accessibility, and self-reliance.

By Amber Westerman , Clay Yapp | July 16, 2026



Over the past few years as a designer and construction coach, I've had the privilege of helping homeowners navigate the complex path to net-zero. In this three-part series, I'll introduce you to my latest clients and the slice of paradise they found in rural Wauzeka, Wisconsin (climate zone 5A). We'll look at their design philosophy, delve into the specific building assemblies they executed—primarily by working solo—and tour the mechanical systems that tied it all together to create a practical, affordable, resilient, and healthy home.

Building a high-performance home is daunting enough for seasoned pros, but for a handful of intrepid rural homeowners, it's becoming the ultimate DIY project. Faced with high construction costs and a chronic shortage of qualified tradespeople, these novices have stepped up their game from "weekend warriors" to full-time owner-builders. Some tackle almost all the work themselves, with occasional help from friends and family, while others act as general contractors, hiring out local trades. Their reasons vary; some hope to save money or ensure strict quality control, while others seek the pure satisfaction of conquering a monumental challenge. Building their own home becomes a literal hero's journey—and for some, it even leads to a new career in the trades.

Finding the right place
One such home, perched on a bluff above the scenic Wisconsin River just upstream from its confluence with the Mississippi, was built by recent city-dwellers Clay and Danielle. Their handsome “farmhouse with a modern twist” net-zero home, adjacent barn, pastures, and large garden support a self-sufficient lifestyle. They call it Omega (Ω), the last place they hope to call home.

> *Omega. As the last letter in the Greek alphabet, it’s the end of the line. The final stop. The cul-de-sac in the suburbs of Life. For me, it represents my last move. The ultimate endgame. With a little luck, it’s the house I’ll die in. With a little more, I’ll finish building it first.* —Clay Yapp



Clay and Danielle’s building site

Their stretch of the Wisconsin River cuts through the geologically unique Driftless Area and is highly protected from development; in fact, the construction project was approved only on condition that the home not be visible to paddlers and river adventurers. This ethos of stewardship, as practiced by the Ho-Chunk Nation, includes the earthen conical, linear, and effigy mounds built by their ancestors—sacred structures that still dot the ridges and bottomlands.

Why build instead of buy?
When it comes to designing a “forever home” in a place this special, clients like Clay and Danielle value quality, durability, and healthy indoor air above all else. Having lived in a variety of typical houses over the years, they are particularly attuned to the false

economy of builder-grade materials and code-minimum standards. They've already paid for the common maladies of production housing; they've dealt with water leaks, mold problems, drafty windows, rooms that won't cool, and soffits that rip off in high winds. As we delve deeper into their high-performance goals—and the meticulous care it takes to achieve true airtightness and robust insulation—these owner-builders quickly begin to appreciate the massive gap between a typical new home and the resilient structure they hope to build.

Designing for self-reliance

My job is to transform their list of ideas or back-of-the-envelope sketches into detailed construction plans that they can thoroughly understand, afford, and execute with confidence. I didn't come into the trades naturally; I'd never picked up a framing hammer or stepped foot onto a construction site until I joined a hard-scrabble commune at the height of the 1960s back-to-the-land movement. What I learned there about passive solar design and natural materials fired my imagination. I went on to earn a degree in architectural technology and spent years working as an estimator and draftsperson, including a valuable stint behind the counter at a builder-focused lumberyard where I discovered I could solve tricky design and construction details that eluded more seasoned contractors.

I established my own design studio in 1998. While environmentally focused design remained my passion, I initially found it difficult to persuade conventional builders to harmonize a home within the landscape or include extra insulation and air-sealing. To bridge that gap, I became a licensed contractor to prove what was possible. In 2020, I completed my first project and advertised it as a "Net-Zero Demonstration Home" (featured in *Fine Homebuilding* issue #307). I built and sold a second net-zero home nearby in 2025. With something tangible to show, attracting like-minded, ambitious clients who want to take control of their own builds became much easier.

Clay brought a solid foundation to the table with years of experience as a remodeling and finish carpenter. He originally got his start in 2007, traveling throughout the Midwest and Gulf Coast providing disaster relief, later returning to residential remodeling under the banner of Clutch Carpentry. His innate drive to solve practical problems began early, fixing his own bicycle in high school quickly evolved into a lifelong curiosity about how to tackle the fundamental tasks of obtaining food, water, and shelter. He saw immense value in saving money, reducing his dependence on paid employment, and leaving a lighter environmental footprint; but even more, he found genuine joy in learning new skills.

Danielle has enjoyed tinkering with house plans and home design since childhood. A researcher extraordinaire, she can often be found down any number of rabbit holes exploring a wide spectrum of topics. Her career path includes 14 years of service (and counting) with the U.S. Department of Agriculture, earning her the title of "family bureaucrat." While she provided steady cash flow during the project, she also researched building assemblies and sourced discounted materials.

Living on-site

It’s a rare homeowner who is willing to live in a small camping trailer for the duration of a major build, but it was just one of the ways the couple made their move affordable. Parked safely inside their newly constructed barn, the trailer was buffered from the worst of the Wisconsin weather. A porta-potty stationed outside, a solar shower in the summer, and occasional winter house-sitting gigs for vacationing neighbors made the arrangement work. On the bright side, the setup allowed Danielle to get her horses established right away, put up fencing, and plant an edible windbreak.



The barn at Omega, Clay and Danielle’s shelter during the build

Before we built our new high-performance home, we’d never lifted a wall. We’d never stacked foundation forms, supervised a concrete pour, or maneuvered trusses into place. We didn’t know then that we’d end up designing and installing the entire ERV system ourselves and building a masonry mass heater from scratch. In 2023, after 16 months of hard work, we moved into our 1,536-sq.-ft. home. Last winter was the first in my life that I felt truly warm. —Clay Yapp

Casting a keen eye on the lay of the land, Danielle envisioned a farmstead that would fit naturally into the south-facing slope, immerse them in expansive views, and simplify daily farm chores. She presented me with a thoroughly thought-out site plan, floor plan, and 3D model. Her scheme combined simplicity of shape with an economy of materials. With some MacGyver-like staging and rigging, it was a design that could genuinely be built by her husband working solo, with only the occasional extra hand.



First floor

The main footprint of the house is a 32-ft. by 32-ft. square on a full walkout basement, with a 16-ft. by 32-ft. upper story yielding 1,536 sq. ft. of living area. The house connects via a breezeway to a 24-ft. by 24-ft. garage. By holding strictly to these dimensions and framing at 24-in. on center, standard 4×8 sheathing waste was limited almost entirely to window and door cutouts. Furthermore, full 8-ft. lengths of ICF foundation blocks could be used, saving both time and money.



Second floor

We're trying to build a really kick-ass house. "Kick-ass" is an utterly subjective term. For us, that means a house that facilitates our efforts to be as self-reliant as possible. If that means going the extra mile and spending a couple of extra bucks to have a more durable and energy-efficient end product, we're all in. —Clay Yapp

Accessibility was also a priority. The main entryway sits just one step up from grade, allowing for the easy future addition of a short ramp. The main floor includes a guest bedroom and an adjacent bathroom featuring a curbless shower. To optimize framing and plumbing runs, the straight-run stairways stack vertically, and both bathrooms align directly above the basement mechanical room.

Building a house, one bargain at a time

To stay on budget, the couple turned bargain hunting into an art form. Armed with a truck, a flatbed trailer, and a highly organized master spreadsheet, they spent several years scouring Facebook Marketplace, building-supply warehouses, scratch-and-dent piles, and Habitat ReStores. Stashing items away ahead of time protected them from making hasty, expensive, retail decisions during the heat of construction. Some of their best scores included ceramic floor tile for the great room, a like-new dishwasher, random-width tongue-and-groove elm for the ceiling, foundation dimple mat, and utility-grade cedar lap siding.

Breaking ground



Groundbreaking at Ω

As a local excavator peeled back the first bucket load of topsoil in mid-August 2022, Clay and Danielle took a deep breath. With a construction loan timeline of exactly one year, the clock was officially ticking. Down in the 12-ft.-deep hole, they gathered their tools and the first bundles of building materials they'd so carefully vetted. The journey had finally begun. In part 2 of this series, we'll look at how Clay tackled the build—from forming up an insulated footing to surviving a slide down an icy roof—all before winter set in hard.